

What is claimed is:

1. A multilayer compensator comprising one or more polymeric A layers and one or more polymeric B layers, wherein:
 1. said A layers comprise a polymer having an out-of-plane (Δn_{th}) birefringence not more negative than -0.01;
 2. said B layers comprise an amorphous polymer having an out-of-plane birefringence more negative than -0.01; and
 3. the overall in-plane retardation (R_{in}) of said multilayer compensator is greater than 20nm and the out-of-plane retardation (R_{th}) of said multilayer compensator is more negative than -20nm.
2. The multilayer compensator of claim 1 wherein at least two of the layers are contiguous.
3. The multilayer compensator of claim 1 wherein all of said A and said B layers are contiguous.
4. The multilayer compensator of claim 1 wherein the combined B layers have a thickness of less than 30 micrometers.
5. The multilayer compensator of claim 1 wherein the combined B layers have a thickness of from 1.0 to 10 micrometers.
6. The multilayer compensator of claim 1 wherein the combined B layers have a thickness of from 2 to 8 micrometers.
7. The multilayer compensator of claim 1 wherein the combined A layers are such that the overall in-plane retardation (R_{in}) of said multilayer compensator is greater than 20nm

8. The multiplayer compensator of claim 1 wherein the combined A layers are such that the overall in-plane retardation (R_{in}) of said multilayer compensator is between 30 and 200nm.

9. The multiplayer compensator of claim 1 wherein the combined A layers are such that the overall in-plane retardation (R_{in}) of said multilayer compensator is between 30 and 150nm.

10. The multiplayer compensator of claim 1 wherein the combined A layers are such that the overall in-plane retardation (R_{in}) of said multilayer compensator is between 30 and 100nm.

11. The multilayer compensator of claim 1 wherein the thickness of the combined A and B layers of the compensator is less than 200 micrometers.

12. The multilayer compensator of claim 1 wherein the thickness of the combined A and B layers of the compensator is from 40 to 150 micrometers.

13. The multilayer compensator of claim 1 wherein the thickness of the combined A and B layers of the compensator is from 80 to 110 micrometers.

14. The multilayer compensator of claim 1 wherein the combined R_{th} of the B layers is -20nm or more negative.

15. The multilayer compensator of claim 1 wherein the combined R_{th} of the B layers is from -600 to -60nm.

16. The multilayer compensator of claim 1 wherein the combined R_{th} of the B layers is from -500 to -50nm.

17. The multilayer compensator of claim 1 wherein at least one B layer comprises a polymer containing in the backbone a non-visible chromophore group and has a T_g above 180°C.

18. The multilayer compensator of claim 1 comprising a polymer in an A layer wherein the T_g of said A polymer is above 180°C.

19. The multilayer compensator of claim 1 wherein a B layer comprises a polymer containing in the backbone a nonvisible chromophore containing a vinyl, carbonyl, amide, imide, ester, carbonate, aromatic, sulfone, or azo, phenyl, naphthyl, biphenyl, bisphenol, or thiophene group.

20. The multilayer compensator of claim 1 wherein a B layer comprises a copolymer containing 1) a poly(4,4'-hexafluoroisopropylidene-bisphenol) terephthalate-co-isophthalate, 2) a poly(4,4'-hexahydro-4,7-methanoindan-5-ylidene bisphenol) terephthalate, 3) a poly(4,4'-isopropylidene-2,2'6,6'-tetrachlorobisphenol) terephthalate-co-isophthalate, 4) a poly(4,4'-hexafluoroisopropylidene)-bisphenol-co-(2-norbornylidene)-bisphenol terephthalate, 5) a poly(4,4'-hexahydro-4,7-methanoindan-5-ylidene)-bisphenol-co-(4,4'-isopropylidene-2,2',6,6'-tetrabromo)-bisphenol terephthalate, 6) a poly(4,4'-isopropylidene-bisphenol-co- 4,4'-(2-norbornylidene) bisphenol) terephthalate-co-isophthalate, or 7) a poly(4,4'-hexafluoroisopropylidene-bisphenol-co- 4,4'-(2-norbornylidene) bisphenol) terephthalate-co-isophthalate.

21. The multiplayer compensator of claim 1 wherein a B layer comprises a copolymer of a poly(4,4'-hexafluoroisopropylidene-bisphenol-co-4,4'-(2-norbornylidene) bisphenol) terephthalate-co-isophthalate

22. The multilayer compensator of claim 1 wherein an A layer comprises a polymer other than a polymer containing in the backbone a non-visible chromophore group having a T_g above 180°C.

23. The multilayer compensator of claim 18 wherein a B layer comprises a polymer containing in the backbone a non-visible chromophore group that does not contain a chromophore off of the backbone
24. The multilayer compensator of claim 1 wherein A layer contains a polymer that comprises triacetylcellulose, cellulose diacetate, cellulose acetate butyrate, polycarbonate, cyclic polyolefin or polyarylate containing fluorene groups.
25. The multilayer compensator of claim 1 wherein an A layer comprises amorphous polymer stretched above glass transition temperature.
26. The multilayer compensator of claim 1 wherein a polymer in an A layer is triacetylcellulose (TAC) or cellulose acetate butyrate (CAB).
27. A liquid crystal display comprising a liquid crystal cell, a pair of crossed polarizers located one on each side of the cell, and at least one compensator of claim 1.
28. The liquid crystal display of claim 27 wherein said liquid crystal cell is a vertically aligned or twisted nematic cell.
29. The liquid crystal display of claim 27 employing optically compensated bend liquid crystal cell.
30. A liquid crystal display comprising a liquid crystal cell, at least one polarizer, a reflective plate, and at least one compensator of claim 1.
31. The liquid crystal display of claim 30 wherein said liquid crystal cell is a vertically aligned, twisted nematic liquid crystal cell.

32. A process for forming a compensator for an LC display comprising coating a B layer in a solvent onto an A layer wherein one or more A layers have in-plane retardation greater than 20nm and one or more B layers that contain an amorphous polymer and have a out-of-plane birefringence more negative than -0.01 and comprise selected polymeric materials having sufficient thickness so that the overall in-plane retardation (R_{in}) of the said compensator is greater than 20nm and the overall out-of-plane retardation (R_{th}) is more negative than -20nm.